POLICY RESEARCH WORKING PAPER 1888

What Do Doctors Want?

Developing Incentives for Doctors to Serve in Indonesia's Rural and Remote Areas

Kenneth M. Chomitz
Gunawan Setiadi
Azrul Azwar
Nusye Ismail
Widiyarti

Like many large countries, Indonesia has difficulty attracting doctors to service in rural and remote areas. The promise of specialist training is an effective but expensive inducement for service in remote areas. It might help to increase the representation of Outer Island students in medical schools, as they are more willing to serve in remote areas.

The World Bank
Development Research Group
March 1998

Summary findings

Like many large countries, Indonesia has difficulty attracting doctors to service in rural and remote areas. To guide the creation of incentives for service in these areas, Chomitz and colleagues analyze two sets of data about physicians: (1) the locations chosen by graduating medical students before and after a major change in the incentive system, and (2) survey data on choices among hypothetical assignments differing in compensation, career prospects, and amenities at various locations.

Their findings suggest that:

- The current policy of offering specialist training is incentive enough to make doctors from Java willing to serve in remote areas. (It is not necessary to also offer a civil service appointment.) But providing specialist training as an incentive to work in remote areas is not only expensive, but potentially inefficient, since specialist practice and rural public health management require different skills and attitudes.
- Moderately (but not extremely) remote areas can be staffed using modest cash incentives.
- Doctors from the Outer Islands are far more willing to serve in remote areas than their counterparts from Java. So, it may be worthwhile increasing the representation of Outer Island students in medical schools (perhaps through scholarships and assistance in pre-university preparation).

This paper — a product of the Development Research Group — is part of a larger effort in the group to develop methods to analyze public policy in the health sector. The study was funded by the Bank's Research Support Budget under the research project "Incentives for Doctor Placement in Rural and Remote Areas" (RPO 681-56). Copies of this paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Teri Charvet, room MC2-522, telephone 202-458-7431, fax 202-522-3230, Internet address mcharvet@worldbank.org. March 1998. (43 pages)

WHAT DO DOCTORS WANT?

Developing Incentives for Doctors to Serve in Indonesia's Rural and Remote Areas

Kenneth M. Chomitz[1]
with
Gunawan Setiadi[2]
Azrul Azwar[3]
Nusye Ismail[3]
Widiyarti[2]

1 .Development Research Group, World Bank
2. Ministry of Health, Republic of Indonesia
3. Indonesian Doctors' Association

Survey implementation: Sjofjan Dalier and Achmad Noorsubchan
Research assistance: Yvonne Ying

This study was supported by grant number RPO 681-56 from the World Bank's Research Support Budget, and by the Indonesian Ministry of Health. We are particularly grateful to the survey respondents and to the deans of the participating medical schools for their help and cooperation. We also thank Howard Barnum for advice and support, and Mead Over for helpful comments.

Address correspondence to:
Kenneth M. Chomitz
World Bank
Washington DC 20433
Email: kchomitz@worldbank.org

1. INTRODUCTION

Understandably, most physicians prefer to settle in urban areas offering opportunities for professional development, education and other amenities for their families, and attractive employment opportunities. But it is in rural and remote areas, especially in the developing countries, that the most severe public health problems are found. As a result, there is a mismatch between the geographic distribution of physicians and the perceived need for them. (Anderson and Rosenberg 1990; World Bank 1994, p 142).

The geographic distribution of physicians is of particular concern for Indonesia. Indonesia's vast size and difficult geography present a tremendous challenge to health services delivery. It is difficult to place doctors in remote island, mountain, or forest locations with few amenities, no opportunities for private practice, and poor communications with the rest of the country. The problem of placing staff in rural areas is further complicated by the rapid growth of lucrative private sector employment prospects in the largest urban areas. In addition, Indonesia's development goals strongly emphasize equity across regions, with particular stress on improving health status in the most remote and poorly served areas. The country's success in placing health centers in all of its subdistricts only increases the challenge of ensuring that those centers are staffed.

To improve the geographical distribution of physicians, governments often have used combinations of compulsory service and incentives. Incentives for rural service have been used in the US (Connor *et al.* 1995), Canada (Bolduc *et al* forthcoming; Anderson and Rosenberg 1990), and Norway (Kristiansen 1992). The evaluation, and optimal design, of incentive systems requires an understanding of the responsiveness of physicians to these incentives. Little, however, is systematically known about physician preferences. For the developed world, there are a handful of studies which apply econometric methods to choice data, most notably Bolduc *et al.* (forthcoming) for Quebec, and Hurley (1989, 1990) for the United States; see also Kristiansen (1992) for Norway. .For the developing world there are only anecdotal reports.

This paper analyzes two complementary sets of data about physician preferences in Indonesia. First, it examines the actual locational choices made by graduating medical students before and

after a major change in the incentive system (the *revealed preference* analysis). Second, it uses survey data on choices among hypothetical assignments to determine physicians' preferences over a set of characteristics describing compensation, career prospects, and locational amenities (the *stated preference* analysis.) It builds on, and provides a quantitative follow-up, to an earlier, focus-group-based study of contract doctor issues in Indonesia (Soemantri *et al* 1996).

2. PHYSICIAN DISTRIBUTION AND HEALTH POLICY IN INDONESIA

In Indonesia, most doctors are trained in, and wish to remain in, the cosmopolitan areas of Java. These areas offer good hospital facilities and lucrative opportunities for private practice. In order to post doctors to the farflung rural health centers of the Indonesian archipelago, the government has long utilized a system of compulsory service for medical school graduates. In the past, those assigned to more remote regions were compensated with shorter periods of service, which ranged from one year at the most remote postings to five years at desirable locations in Java. Following completion of compulsory service, doctors were assured positions in the civil service hierarchy, including opportunities for specialist training.

In 1992, this system was modified. Because of a freeze on new civil service hiring, doctors were hired under contract rather than as civil service employees. Service was (and remains) however a prerequisite for obtaining a license to practice. All service is for a period of three years. Pay is tied to remoteness, however. Currently, doctors serving in 'ordinary' regions are paid Rp 500,000/mo; those in remote regions, Rp 825,000, and those in very remote regions, Rp 1,050,000/mo. Because doctors in ordinary regions have much greater opportunities for supplementary earnings from private practice, total income differentials are much smaller. A doctor working in a 24-hour clinic in Jakarta could probably earn about Rp 1,000,000/month (though this would be illegal if the doctor had not yet completed compulsory service.) Considering the difference in amenities associated with remote postings, the salary incentives are relatively modest.

Recognizing this, in 1996, the system was further modified. It was announced that the doctors serving in very remote regions would be given a 90% chance of subsequent civil service appointment; those serving in remote regions would have a 50% chance, but the probability drops to 10% for those serving in ordinary areas. Because civil servants are eligible for subsidized

specialist training, and because specialists enjoy both high prestige and income, this was expected to serve as a powerful inducement. Section 5 of this paper analyzes the impact of this change in incentive structure.

A number of important policy questions surround the medium and long-term viability of this policy. From the public viewpoint, the policy of offering civil service appointments and specialist training as an incentive is effective – as we shall see below -- but expensive. It costs approximately Rp 60 million to provide specialist training, not including the value of the student's time. Since the skills appropriate to running a remote health center differ from those appropriate to a clinical specialist, the incentive policy may result in mismatches of personnel to these two quite different positions. Deferring specialist training for the three years of compulsory service reduces tbe return on that training. Finally, using civil service positions as an incentive is problematic given the government's policy of zero net growth in the civil service.

For these reasons, there is interest in alternative means for attracting doctors to remote locations. One possibility is to assemble alternative incentive packages. Suggested alternatives include higher cash salaries (Soemantri and others 1996), and reduced periods of compulsory service. Another possibility is to intensify recruiting of medical students from rural and remote areas, via scholarships, training programs, or placement of new medical schools.

Many doctors are dissatisified with the system. The compulsory nature of the system imposes a particular burden on some graduates, many of them married women, who live in urban Java and are unable for personal reasons to move to other locations. Since there are few openings for compulsory service in these areas, these graduates are indefinitely barred from legally practicing medicine. More generally, graduates of private medical schools question the rationale for compulsory service. So an important question is how much it would cost to attract doctors to health centers if compulsory service were dropped. In many ways the issue parallels the US debate on the all-volunteer army, which also involved considerations of equity, social solidarity, and economic efficiency.

Finally, the labor market for doctors is changing rapidly. While there are current concerns about unemployment of young physicians, the rapid growth of incomes in Indonesia, combined with the expansion of health insurance schemes in the formal sector, suggests that there will be very rapid

increases in urban demand for physicians. This in turn raises the question of the cost of maintaining physician services in "ordinary" rural regions -- those which are not remote, but which lack urban amenities. Regardless of whether services are financed by public or private sources, it is of interest to forecast the levels of compensating differentials in salaries that might be necessary to retain physicians in these areas.

3. MODELING PHYSICIAN PREFERENCES

Revealed and stated preference data

Economists' natural tendency is to prefer data on actual choices (revealed preferences) to data on stated preferences. Hurley (1989), Bolduc and others (forthcoming), and section 4 below use this approach. While this approach has the considerable advantage of an incontravertible grounding in reality, it has several disadvantages. Most importantly, the range of variation of the alternatives may be narrow. This can make it impossible to predict doctors' reactions to new policy initiatives which, for instance, offer new types or magnitudes of incentives. Second, it may be difficult to obtain data on the attributes of the choices, as seen by the doctors. Third, there may be considerable multicollinearity among the location-specific attributes of interest, making it difficult to disentangle their impact on utility. Finally, the need to consider a very large number of alternatives requires complex and possibly nonrobust estimation methods.

The use of stated-preference data can overcome these problems (Louviere 1994). Stated-preference data has increasingly been used in market research to assess consumer reaction to proposed products, and in environmental economics for valuation of nonmarket goods. In one variant, choice-based conjoint analysis, respondents are asked to choose between hypothetical alternatives, where each alternative is described as a bundle of attributes. Because the researcher has complete freedom to specify the levels of the attributes, these can encompass ranges of policy interest, and can be constructed so as to be free of multicollinearity.

Applications of stated-preference discrete-choice models are quite varied. There is a growing literature on dichotomous-choice contingent valuation models (see, e.g. Alberini and others, 1997). These models typically estimate the demand for a hypothetical environmental good or bad. Typically the choices vary only in the presence or absence of the good, and the level of a compensating payment or charge. More akin to the work presented in this paper are studies

which look at preferences over bundles of attributes. For instance, Bunch and others (1993) are interested in the potential demand for electric vehicles, and assess consumers' preferences over alternative combinations of purchase price, fuel cost, and range between refueling, in hypothetical electric and gasoline-powered autos. Adamowicz, Louviere, and Williams (1994) analyze demand for water-based recreational site characteristics such as water quality, type and quantity of fish present, and entry fee.

The chief risk of the stated preference approach is that stated responses may not accurately reflect behavior. For instance, Cummings and others (1995) asked respondents if they would be willing to purchase specified small items (chocolate, a calculator) at certain prices; the researchers then actually offered the items for sale at those prices. They found that stated willingness to purchase was greater than actual willingness. However, they note that this may be an unfair test; stated preference respondents may be expressing willingness to purchase at some time in the future, while the actual purchase decision was to be made on the spot. In contrast, Louviere (1994) cites a number of studies showing a good correspondence between predictions derived from stated preference models and actual market behavior. Adamowicz, Louviere, and Williams (1994) retrieved very similar preference functions from a group of respondents using both revealed preference and stated preference analyses. This suggests that respondents can competently manage hypothetical questions, and that responses are at least qualitatively reliable. A more serious problem, especially in the current context, is the potential for strategic misrepresentation, if respondents believe that incorrect information can yield personal gain. In this paper, we utilize both types of surveys, checking for consistency.

Utility functions for the nontechnical reader

Note: the technical reader may prefer to skip this section.

In order to analyze physician preferences, we use an economic approach called utility theory. This approach supposes that doctors choose between alternative assignments *as if* they have a system for assigning preference scores ('utilities') to each alternative, after which they choose the alternative with the highest score. For instance, suppose that doctors are choosing among alternatives which differ in salary, contract length and remoteness. One doctor might evaluate the positions with a rule like this: add 2 points for every Rp. 100,000/month in salary; subtract 11 points for every year of contract length; subtract 20 points if the location is remote, and 30 points

if it is very remote. Another doctor, with a greater relative desire for cash and tolerance for disamenities, might assign 4 points for every Rp. 100,000/month, but only subtract 5 points for remote location.

The methodology used here employs statistical methods to deduce particular scoring systems for particular types of doctors, so that these scoring systems describe doctors' observed choices as well as possible. In the *revealed preference* analysis, we look at how doctors' characteristics affect their choices among four broad locational classes of assignments. In the *stated preference* analysis, we ask doctors to choose among hypothetical assignments described in more detail, focusing on how the characteristics of the assignments affect the doctors' choices among them.

Utility function specification

Note: nontechnical readers may refer to the previous subsection and skip this one.

Utility-theoretic models of physician choice of location have been estimated by Hurley (1989) for the US, Bolduc and others (forthcoming) for Canada. These models are special cases of standard random utility model (see Louviere 1994, Berry 1994):

$$U_{ij} = f(x_i, z_j) + u_{ij}$$

where

U_{ij} is the utility of doctor i for assignment j,
x_i are characteristics of doctor i
z_j are characteristics of assignment j
and u_{ij} is a random disturbance term.

Doctors are assumed to choose the alternative with the highest utility. The nature of the data, and assumptions about the nature of the disturbance term determine the method of estimation. Strong assumptions about the error terms yield an easy-to-estimate multinomial logit model. The key assumption is the independence of irrelevant alternatives, which is equivalent to assuming that the u_{ij} are independent between j; that is, that unobserved factors affecting a doctor's liking for

alternative 1 are uncorrelated with unobserved factors affecting her taste for alternative 2. Where a larger number of closely-related alternatives are considered, this assumption is not tenable. Hurley therefore uses a nested logit model, and Bolduc and others use a sophisticated, computationally demanding multinomial probit model. In the revealed preference analysis below, we address this problem by aggregating the alternatives into arguably distinctive categories.

The specification of f depends on the nature of the available data. If there is information about the doctors, but little or no information about attributes of the choices, it is natural to choose the form:

$$f(\mathbf{x}_i, \mathbf{z}_j) = \mathbf{x}_i\beta_j + u_{ij}$$

with separate parameter vectors for each of a limited number of alternatives j. If the disturbances u_{ij} are assumed to have independent identical Weibull distributions, then this yields a multinomial logit model, with:

$$\text{probability (i chooses j)} = \exp(\mathbf{x}_i\beta_j)/[\Sigma_k\, \mathbf{x}_i\beta_k]$$

(where β_0 are normalized to 0 for some comparison group)

This approach was used in the revealed preference analysis. The locational choices were grouped into four categories: j= Java/Bali, the comparison group; outer islands nonremote; outer islands remote; outer islands very remote. Separate parameter vectors were estimated, via multinomial logit, for each of the categories except the first.

Where there is extensive information about characteristics of the choices, it is more convenient to estimate:

(1) $$U_{ij} = \mathbf{X}_{ij}\beta + u_{ij}$$

where the vector X describes attributes of the choice, the doctor, and their interaction, and there is now a single parameter vector β. (In practice, separate equations can be estimated for distinct groups, e.g., males and females).

This was the approach used in the stated preference analysis. In each choice task, the respondent is presented with two alternatives. Alternative 1 is chosen if:

$$U_{i1} > U_{i2}$$

This condition holds if:

$$(\mathbf{X}_{i1} - \mathbf{X}_{i2})\,\beta + (u_{i1} - u_{i2}) > 0$$

If we assume that the disturbance terms u are independently and identically distributed, and define

(2)
$$y^* = (\mathbf{X}_{i1} - \mathbf{X}_{i2})\,\beta + (u_{i1} - u_{i2})$$
$$y=1 \text{ if choice is assignment 1}$$

then we have a simple probit model.

Note that there is no constant term, because utilities are defined only up to an additive constant. In addition, the differencing prodedure makes it necessary to exclude one member of *each* set of mutually exclusive dummy variables to avoid the dummy variable trap.

The assumption of independent, homoscedastic error terms facilitates analysis, and has been standard in the literature. It can be thought of as representing a random error as the respondent tries to come up with a utility estimate. It is however a strong assumption, and its failure would mean that estimates are inconsistent. Further, it does not well represent taste heterogeneity, and can be thought of

A direction for future work is to allow for taste heterogeneity by through a random coefficients specification (Berry 1993). The earlier framework would be modified to become:

$$U_{ij} = \mathbf{X}_{ij}\beta$$
$$\text{where } \beta = \beta^* + \mathbf{e}_i$$
$$e_i \sim N(0,\Omega), \text{ with } e_i \text{ uncorrelated between individuals}$$

Now the vector β^* describe mean tastes: the mean coefficient for each attribute. Actual tastes vary between individuals. For instance, individuals with a high marginal utility for income would have a high e_{income}; those with a high marginal disutility for remote areas would have a negative

$e_{remoteness}$. The general form for the variance-covariance matrix of **e** reflects the possibility that tastes for particular attributes are intercorrelated across the population; for instance, the marginal utility of income and remoteness may be negatively correlated. This model can be rewritten in the form of (2) as:

$$y^* = (\mathbf{X}_{i1} - \mathbf{X}_{i2})\,\beta^* + (\mathbf{X}_{i1}\mathbf{e}_i - \mathbf{X}_{i2}\mathbf{e}_i)$$

where now the variance of the error term is a function of X_{i1},X_{i2}, and Ω. This can in principle be estimated by an appropriately-adjusted probit. (Chesher 1995 suggests an alternate but similar approach, heterogeneity-adjusted logit.) However, this becomes computationally challenging where, as in the present case, Ω would have a large number of parameters to be estimated. Note also that if a respondent replies to multiple choice tasks, the errors will be correlated across those tasks, further complicating estimation. These econometric refinements are left for future work.

4. REVEALED PREFERENCE ANALYSIS[1]

Background and data

Each year, the Ministry of Health assigns two or three batches of graduating medical students to the compulsory contract positions. To facilitate the process, each candidate is asked to specify first, second, and third choices of posting. Each choice consists of both a province and a remoteness category: ordinary or nonremote (*biasa)*, remote (*terpencil*) and very remote *(sangat terpencil*). Not all combinations are possible; there are virtually no 'very remote' postings in Java, and no 'ordinary' postings in some outlying provinces. To reduce the large number of alternatives to a more manageable set -- and one to which the independence of irrelevant alternatives assumption might plausibly apply -- we aggregated the available choices into four broad alternatives, based on the combination of province and remoteness:

	Java & Bali	*Outer Islands*
Nonremote	Alternative 0	Alternative 1
Remote	(comparison	Alternative 2
Very remote	group)	Alternative 3

Note: there are few remote postings and almost no very remote postings in Java-Bali.

[1] Primary contributors to this section are Kenneth Chomitz and Gunawan Setiadi.

Alternative 0, Java-Bali, consists overwhelmingly of nonremote postings. This was used as the comparison group which multinomial logit requires. That is, sets of coefficients were estimated for each of the other three groups. The equation for one of these groups give the predicted logarithm of the odds of choosing that group relative to the comparison group.

We obtained the choice data for the 12^{th} and 13^{th} assignment batches. The latter was the first under the new policy linking service in remote areas to subsequent civil service appointment. Basic demographic and background data were also obtained for each candidate, including age, gender, marital status, number of children, religion, and medical faculty. Because graduates who do not accept an assignment are held over and permitted to bid in subsequent batches, we restricted our attention to those who had registered after the cutoff for the previous batch in order to focus on the choices of new entrants to the process.

Appendix table 1 shows definitions and mean values of independent variables for the two batches.

Results and discussion

Simple cross tabulations (see Table 1) show the powerful impact of the change in incentives. In batch 12, among students graduating from medical faculties in Java/Bali, only 5.6% of males and 1.7% of females volunteered to go to very remote areas in the Outer Islands. In batch 13, those proportions increased to 20.7% and 6.7%. The cross tabulations also show that, regardless of the incentive regime, students from outer island faculties are far more likely to volunteer for remote and very remote outer island assignments than are students from Java/Bali faculties.

Multivariate analysis allows us to determine whether these observed relations are due to omitted factors such as age or private schooling. This is potentially important since the mix of doctors (e.g., proportion from private school) varies substantially between batches. The multinomial logit results are shown in appendix table 2 . For both batches 12 and 13, the results are extremely statistically significant. Tables of predicted versus actual choices are shown below.

Predicted versus actual choices: Batch 12

Actual choice	predicted choice				
		Outer Island			
	Java/Bali	nonremote	remote	very rem	Total
Java Bali	360	7	12	1	380
OI:nonremote	37	23	20	1	81
OI: remote	24	11	35	2	72
OI: very remote	16	1	20	2	39
Total	437	42	87	6	572

Predicted versus actual choices: Batch 13

Actual choice	predicted				
		Outer Island			
	Java/Bali	nonremote	remote	very remote	Total
Java/Bali	89	31	13	1	134
OI: nonremote	43	109	47	23	222
OI: remote	19	82	76	21	198
OI: very remote	21	23	39	41	124
Total	172	245	175	86	678

Main results

The results are most easily understood by examining the predicted effect of a change in a particular variable on the choice probabilities. Figure 1 shows the predicted choice probabilities of four classes of students: male/female x Java-Bali medical school /Outer Island medical school, for the two batches[2]. These predictions closely mirror the cross-tabulation results presented above. There are several important results:

1) Incentives had a large impact on the willingness of Java/Bali graduates to volunteer for remote and very remote posts.

Compare the columns marked "Java male 12", "Java male 13". Controlling for other characteristics, the proportion willing to go to ordinary or remote posts in the outer islands

[2] Other variables set as follows: graduation year = 1995, birthyear= 1967, unmarried, public school graduate.

increases almost threefold, from about 17% to about 50%. The proportion willing to go to very remote posts increases more than fivefold, from 3.1% to 17.8%.

It is particularly striking that incentives also have a strong impact on females, since women are sometimes said to have less flexibility. It is true that women from Java/Bali schools are on average less willing to volunteer for remoter posts (compare the columns "Java male 12" and "Java female 12"). Nevertheless, there was a substantial reponse to the introduction of improved incentives: the proportion willing to go to Outer Island nonremote posts increased from 5.8% to 28.1%; the proportion willing to go to very remote posts increased from 3.5% to 9.5%.

2) Graduates of outer island medical schools are substantially more likely to volunteer for service in remote areas than graduates of Java/Bali schools.

This effect is large, statistically significant at the .001 level, and especially true in the absence of incentives. In batch 12, for instance, the predicted probability of volunteering for a remote or very remote post is 75% for an outer island male graduate, against 17% for a Java/Bali male graduate. Among women in batch 12, 46% of outer island graduates were predicted to choose outer island remote posts, as opposed to just 5% of Java/Bali graduates. The introduction of improved incentives reduces, but does not eliminate, the differential between outer island and Java/Bali graduates.

Differentials by public vs. private schooling

In the estimates for batch 13 males, a dummy for private school attendance enters positively and significantly in the equations for nonremote and remote outer island assignments. For batch 12 males, the dummy is positive and significant in the nonremote outer island equation, negative and significant in the very remote outer island equation. The variable is nowhere significant in the estimates for females. The predicted impacts for males, batch 13, are shown in figure 2. Other things equal, males from Java/Bali private schools are slightly more willing to volunteer for outer island posts, but less willing to volunteer for very remote postings (18% vs. 25%).

Marital status and children

The effects of marital status and children are weaker than might be expected. It is clear from the coefficient estimates that married women with children do not volunteer for posts in very remote areas. Otherwise, however, there are no statistically significant effects of current marital status on women's willingness to volunteer for remote postings. However, it may well be the case that it is expectations about marriage and children which matter, not current status. At this stage in their life cycle, many doctors may anticipate marrying at about the same time that they undertake their compulsory service.

Other things equal, currently married men are less willing to volunteer for nonremote outer island and remote outer island posts. For males from Java/Bali schools, being married reduces willingess to go to any outer island post from 68% to 48%.

Effect of age and time since graduation

In the batch 12 results, age and graduation year had small, statistically insignificant impacts. In batch 13, however, the impacts are profound. Figure 3 shows the predicted probabilities by gender for graduates of Java/Bali schools for three age/graduation date combinations. (The columns are labeled by gender, m/f; age in 1996; and graduation year of '90 or '96.) The results suggest that recent (1996) graduates are far more responsive to incentives than earlier graduates (1990). This is highly plausible, since the latter are more likely to have developed family and employment ties which reduce their flexibility. Age independently reduces the willingness to volunteer for outer island remote postings.

Summary

Tying service in remote areas to subsequent civil service appointment was, according to this analysis, sufficient to drastically boost the willingess of graduates of Java/Bali schools to serve in outer island and remote areas. However, the post-incentive willingess of these graduates to serve in remote areas was lower than the pre-incentive willingness of graduates from schools in the outer islands.

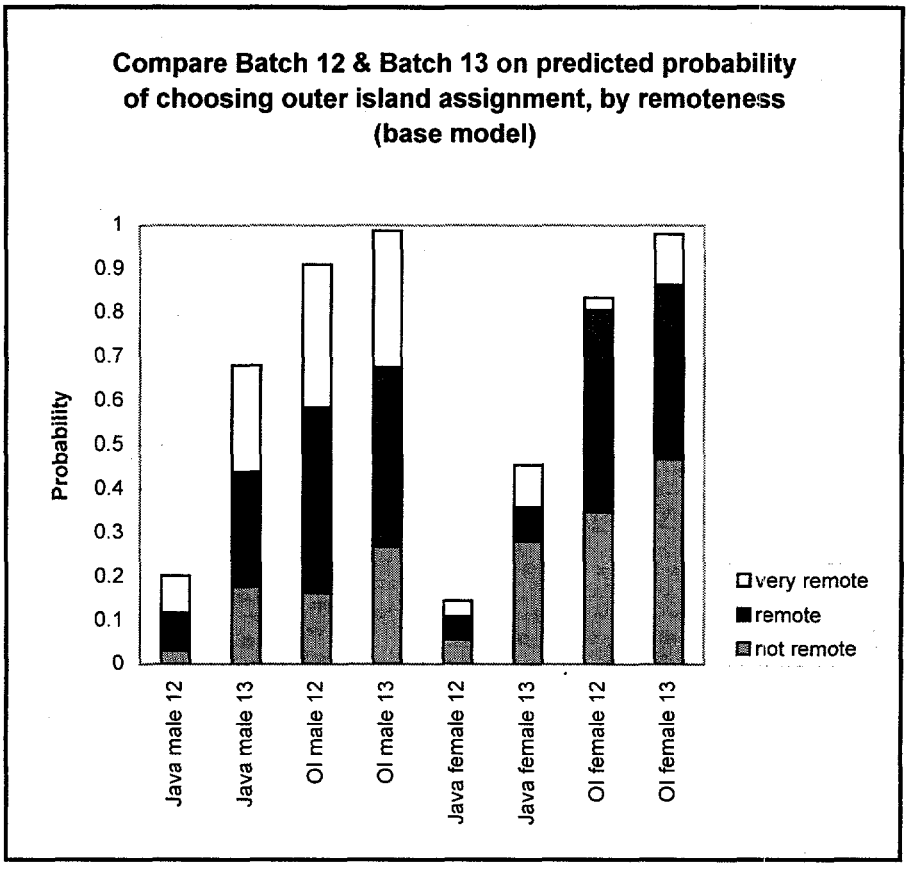

Figure 1

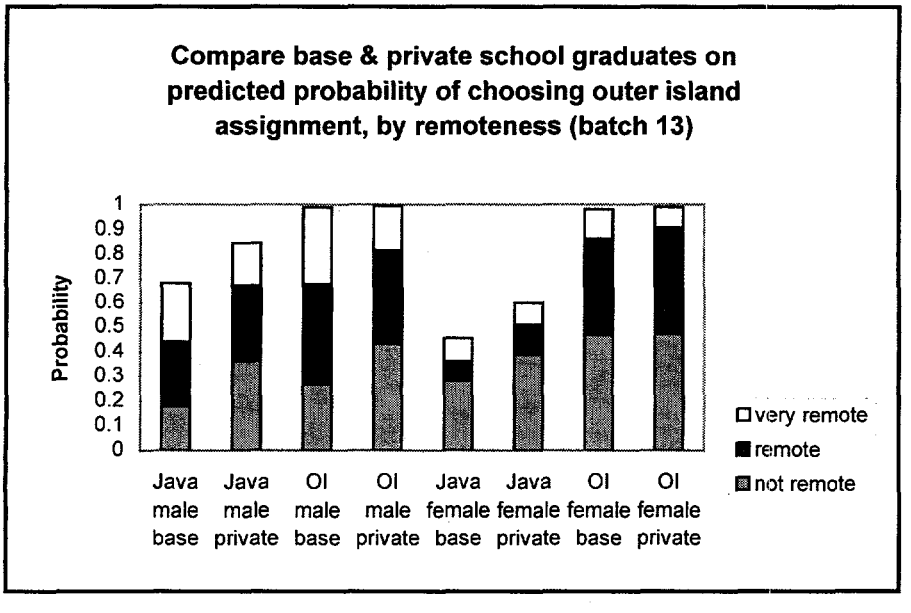

Figure 2

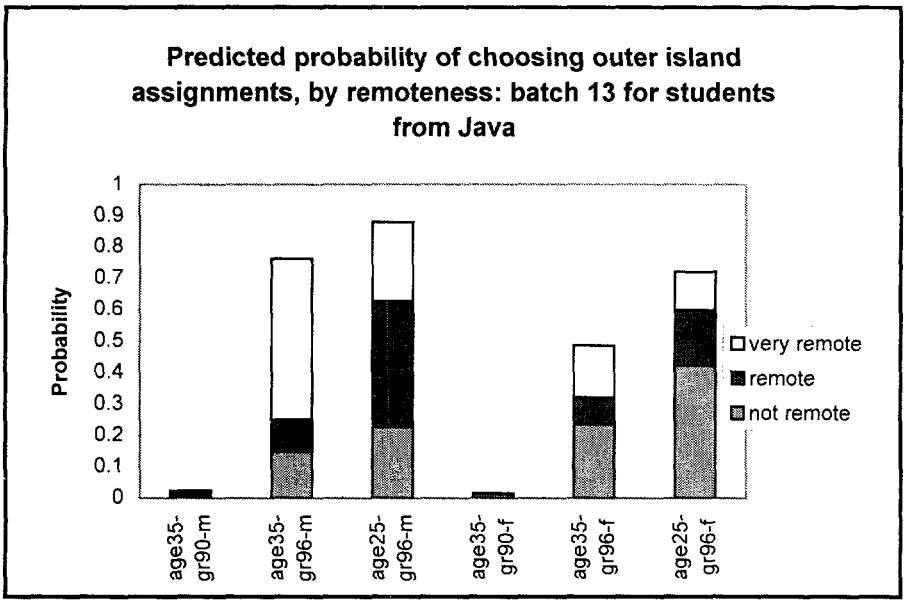
Predicted probability of choosing outer island assignments, by remoteness: batch 13 for students from Java
Probability
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
age35-gr90-m
age35-gr96-m
age25-gr96-m
age35-gr90-f
age35-gr96-f
age25-gr96-f
very remote
remote
not remote

Figure 3

TABLE 1: CHOICES BY STUDENTS OF LOCATIONS FOR PTT SERVICE

BATCH 12: STUDENTS FROM JAWA/BALI SCHOOLS

	Jawa/Bali	Outer Islands biasa	terpencil	sangat terp.	Total
male	169	15	18	12	214
	78.97	7.01	8.41	5.61	100.00
female	202	23	9	4	238
	84.87	9.66	3.78	1.68	100.00
Total	371	38	27	16	452
	82.08	8.41	5.97	3.54	100.00

BATCH 13: STUDENTS FROM JAWA/BALI SCHOOLS

	Jawa/Bali	Outer Islands biasa	Terpencil	sangat terp.	Total
male	63	47	55	43	208
	30.29	22.60	26.44	20.67	100.00
female	68	53	18	10	149
	45.64	35.57	12.08	6.71	100.00
Total	131	100	73	53	357
	36.69	28.01	20.45	14.85	100.00

BATCH 12: STUDENTS FROM OUTER ISLAND SCHOOLS

	Jawa/Bali	Outer Islands biasa	terpencil	sangat terp.	Total
male	8	18	29	22	77
	10.39	23.38	37.66	28.57	100.00
female	12	26	20	1	59
	20.34	44.07	33.90	1.69	100.00
Total	20	44	49	23	136
	14.71	32.35	36.03	16.91	100.00

BATCH 13: STUDENTS FROM OUTER ISLAND SCHOOLS

	Jawa/Bali	Outer Islands biasa	terpencil	sangat terp.	Total
male	3	49	67	60	179
	1.68	27.37	37.43	33.52	100.00
female	3	74	59	11	147
	2.04	50.34	40.14	7.48	100.00
Total	6	123	126	71	326
	1.84	37.73	38.65	21.78	100.00

5. STATED PREFERENCE ANALYSIS

Background and motivation

The stated-preference analysis was designed to answer questions which could not be answered with the revealed preference analysis, in particular:

- How responsive are doctors to increased salary incentives, as opposed to the incentive of civil service appointment?
- Is the civil service appointment attractive mostly because of the educational benefits it provides, or also because of the security and status of civil service positions?
- Holding constant the province of assignment, what are the preferences of doctors for different degrees of remoteness?

The large sample of the stated-preference survey also allows a more detailed look at the influence of doctor characteristics on doctor preferences.

Sample

The stated-preference survey was targeted on final-year medical students, who would be shortly facing the task of choosing locations for their compulsory medical service. The survey covered 14 of Indonesia's 32 medical schools, a group comprising 70% of all graduates[3]. It encompassed public and private schools, and included three off-Java schools . The survey was administered to 585 final-year students. An effort was made to recruit as many respondents as possible; randomness of selection was therefore sacrificed in order to maximize sample size. Surveys were administered examination-style to groups of students; discussion was prohibited during survey administration. Surveys were conducted over the period May-June 1997.

Instrument

The survey instrument consisted of two parts: a set of choice tasks, and a series of background questions on respondent characteristics (see appendix B). Each respondent faced a set of eighteen choice tasks. Each task consisted of a choice between two hypothetical job assignments.

[3] Based on the latest available data, for 1994. Seven newly-founded schools had no graduates during that year.

An assignment was defined by a combination of seven attributes, each with a range of values as follows:

Attribute	*Range*
Province	Jakarta, Central Java, South Sulawesi, Northern Sumatra, Central Kalimantan, East Nusa Tenggara, Irian Jaya
Remoteness	non-remote, remote, or very remote.
Total monthly income	from Rp. 500,000 (approx. $200) to Rp. 3,000,000 (approx. $1200)
Length of contract	1, 2, or 3 years
Probability of subsequent appointment to the civil service	from 10% to 90%
Probability of subsequent specialist training	from 10% to 90%

An important feature of this framework is the delinking of specialist training from civil service. In practice, these two benefits have always been linked. We know from the revealed preference analysis that the combination of the two serves as a powerful incentive. This analysis allows us to assess the separate impact of each benefit.

EXAMPLE OF A CHOICE TASK

Pilihan yang mana lebih disukai? Lingkari 1 atau 2.
Which choice do you prefer? Circle 1 or 2.

	1	2
Propinsi (Province)	**Kalimantan Tengah**	**Nusa Tenggara Timur**
Keterpencilan (remoteness)	**Terpencil (*remote)***	**Sangat terpencil *(very remote)***
Tempat kerja (workplace)	**Puskesmas *(health center)***	**Puskesmas *(health center)***
Lama ikatan kerja (contract length)	**2 tahun** ***(2 years)***	**1 tahun** ***(1 year)***
Pendapatan/bulan, semua sumber (monthly income, all sources)	**Rp 2.500.000**	**Rp 3.000.000**
Kemungkinan diangkat Pegawai Negeri (probability of appointment as a civil servant)	**70%**	**50%**
Kemungkinan spesialisasi (probability of specialist training)	**50%**	**90%**

Box 1

Some combinations of attributes were prohibited as impossible, for instance remote or very remote health centers in Jakarta. (See Annex B4.) The combinations of attributes were randomly generated using the Choice-Based-Conjoint program (Sawtooth Software, n.d.). Fifty different

sets of eighteen tasks were generated. An example of a choice task is shown in Box 1. Instructions to the respondents are reproduced in appendix B3.

Results

Four models were run, for each combination of gender and outer island vs. Java/Bali birthplace. The basic independent variables were differences between choice 1 and choice 2 in the seven attributes listed above. In addition, private school was interacted with the income, civil service, and specialist training difference variables; the characteristic, "grew up in rural areas or a small town" was interacted with the difference in the very remote and remote dummies; a dummy for "ever failed a course" was interacted with probability of specialist training; and difference variables were created for the variables homeprov and schoolprov. Homeprov (schoolprov) took the value 1 if the assignment province (school province) was the same as the respondent's birthprovince, zero otherwise. Statistically insignificant interaction variables were dropped from the equations, which were then rerun[4]. Final estimates are shown in appendix table 4. The robust standard errors allow for intercorrelation among the errors of the 18 responses of a particular respondent. The equations were extremely statistically significant. Approximately 77% of all responses are correctly predicted by the equations.[5]

The coefficients are almost all plausible and statistically significant. A useful way interpreting them is to express the utility or disutility of each attribute in terms of monetary equivalents. For instance, if the estimated utility function is:

U= 10*(salary in thousand rupiahs/mo) - 2000 (contract length in years) + 50000(probability of specialist training)

then:

- a one year *decrease* in the contract length is equivalent to a Rp 200 (==2000/10) thousand *increase* in monthly salary; i.e. the cash equivalent of an additional year of contract length is Rp-200,000 (the minus sign indicates that contract length is a disamenity, something that is disliked)

[4] Some alternative specifications, including logarithmic terms in income, and interactions of contract length with remoteness of location, did not provide better explanatory power.

[5] Keep in mind that about 50% of the responses could be correctly predicted either randomly, or by always choosing '1'.

- certainty of receiving specialist training is equivalent to a Rp 5000 (=50000/10) thousand *increase* in monthly salary; i.e., the cash equivalent of specialty training is Rp 5 million/month.

TABLE OF COMPENSATING DIFFERENTIALS

This table shows compensating differentials based on the coefficients of appendix table 4. Locational preferences are relative to a private health clinic in Jakarta. Figures shown in *italics* are not significantly different from zero[6]. Note that some private school coefficients are constrained to be equal to the corresponding public school coefficients.

Gender	**Male**	**Male**	**Female**	**Female**	**Male**	**Male**	**Female**	**Female**
Birthplace	Java	Java	Java	Java	Outer Is	Outer Is	Outer Is	Outer Is
Pub/ private	Public	Private	Public	Private	Public	Private	Public	Private
Length (years)	-187	-1,279	-429	-842	+18	-443	-339	
PNS	2189	17	2691	2691	2604	1406	4234	1708
Specialist training	9247-200*age	20809-450*age	11349-255*age	11349-255*age	12489-322*age	13859-322*age	11324-289*age	11324-289*age
Biasa	*36*	*82*	*20*	*20*	+272	+272	+539	+539
Terpencil	*-91*	*-205*	-1303	-1303	*-63*	*-63*	-339	-339
Sangat Terpencil	-974	-2194	-3066	-3066	-615	-615	-1475	-1475
post in province of schooling	442	995	835	835	954	954	1821	1821
JaTeng	*-246*	*-555*	+873	+873	*0*	*0*	*-207*	*-207*
KalTeng	-1147	-2514	-1155	-1155	*+125*	*+125*	*-762*	*-762*
SulSel	-829	-1867	-1089	-1089	-263	-263	-1262	-1262
NTT	-935	-2105	-1061	-1061	-237	-237	-1619	-1619
SumUt	-484	-1088	*-727*	*-727*	*+39*	*+39*	-748	-748
IrJa	-1982	-4462	-3059	-3059	-500	-500	-2472	-2472

[6] These significance statements are made on the basis of the coefficient of the variable in question; they should properly be based on the ratio of that coefficient to the coefficient of salary.

The results are organized in the table of compensating differentials. Consider the first column, referring to male public school graduates from Java/Bali. On average within this group, and holding location, career prospects and all else equal, graduates would be willing to forgo Rp 187,000 /month in income in order to reduce contract length by one year. (It is important to remember that this represents median preferences -- some would accept a smaller reduction, others would demand a larger one). Private school graduates (second column) have a much higher disutility for contract length. For them, a year of reduced service is worth almost Rp 1.3 million/month.

A large value is attached to civil service appointment by public school graduates, even in the absence of specialist training. An increase in the probability of appointment from 0% to 100% is valued on average at Rp 2,189,000/month by male public school graduates from Java/Bali.

Continuing down the first column, males from Java/Bali place an extremely high value on specialist training. On average, a 25 year old graduate values this at Rp 4,247,000/month. This is quite reasonable given the increase in earnings associated with specialist education. Value declines with age, reflecting the shorter working lifetime of the training, and perhaps the perceived chance of being deemed to old to enter specialist training.

As expected, a huge disutility is attached to very remote (*sangat terpencil*) location -- this requires a compensating differential of nearly a million rupiah/month, compared to service in a nonremote private clinic. Surprisingly, however, there is no significant disutility attached to service in remote or nonremote health centers relative to nonremote private clinics, controlling for province. This is the most unexpected finding of the analysis.

The relative magnitudes of the disutilities attached to the provinces are in accord with popular perceptions of the desirability of these postings for a cosmopolitan Javanese. Central Java is rated as 'worth' Rp 246,000/month less than Jakarta (the comparison location) to a public school graduate, though this difference is not statistically significant. Northern Sumatra, which boasts a large metropolis with good career prospects, has a relatively low disutility attached to it. The remote provinces of Nusa Tenggara Timur (NTT) and Central Kalimantan (KalTeng) require compensating differentials of about Rp 1 million/month. Irian Jaya, the province with the most challenging conditions, requires a differential of nearly Rp 2 million /month, in addition to the

differentials for very remote locations. A post in the province of schooling is considered worth Rp. 442,000/month. (A separate variable for posting in home province was not significant.)

The second column repeats these calculations for male private school graduates from Java/Bali. There are some striking differences. Essentially no value is attached to a civil service appointment by itself (as opposed to specialist training). The compensating differential attached to length of service is very high: Rp -1,279,000/month, versus Rp -187,000 for the public school counterparts. The differentials attached to service in more remote provinces are about twice as high as those for the public school graduates. Posting in the province of schooling (likely to also be the student's home province) is valued at almost Rp 1 million/month.

The third column describes the preferences of female public school graduates from Java/Bali. Compared to their male counterparts, they have a higher disutility for contract length, with an additional year equivalent to a loss of Rp 429,000/month. As with the males, they place a very high value both on civil service appointment and on specialist training. The locational values show interesting, and expected, contrasts with the males. Unlike the males, the females place a very high disutility on remote (*terpencil*) locations: these carry a disutility equivalent to a loss of Rp 1,303,000/month. Very remote locations carry an immense penalty of over Rp 3 million/month, three times the disutility expressed by males. The province-specific values are similar to those of the males, with two differences. First, the females actually have a strong preference for Central Java relative to Jakarta. Second, they have on average a much stronger distaste for service in Irian Jaya. Service at a very remote location in Irian Jaya would require a compensating differential of more than Rp 6 million/month in cash, in order to be equivalent to a nonremote post in Jakarta.

Turning now to outer island male public school graduates (column 5), there are some interesting contrasts with their Java-born counterparts. The outer island males do not attach any significant disutility to contract length. They prefer nonremote health centers to nonremote private clinics. The disutility they attach to very remote locations (Rp -615,000/month) is one-third less than their Javan counterparts. The province-specific disutilities are quite low compared to the Javans: there is essentially no disutility attached to service in Central Kalimantan, and only Rp -500,000/month for service in Irian Jaya. Finally, outer island females are intermediate between Javan males and Javan females in terms of their disutility for remote and very remote posts.

Outer island females place an extremely high premium on service in their province of schooling (Rp 1.8 million/month), but they also place a high premium on service in their birth province (Rp 1,082,000/month, not shown in table).

Discussion

There are several potential sources of bias in these results. First, the respondents may not have understood, or complied with, the instructions regarding the choice scenario. For instance, they may believe that choice of a remote location would in fact increase their chance of receiving specialist training, regardless of the probability assigned in the choice task. Second, the respondents may have strategic reasons for misstating their preferences. They may believe, for instance, that they can influence public policy in their favor by overstating the salary or training benefits necessary to induce service in remote areas. Or they may believe that 'socially acceptable' responses indicating willingness to serve in remote areas will in some way yield individual or group benefits.

One way to check the results is to compare them to the revealed preference analysis. There is strong qualitative consistency between the two analyses. Both show similar differentials in preferences between males and females, between outer island and Java/Bali graduates, and among age or graduation groups. Both show very strong responsiveness to civil-service related incentives. In particular, the increase between batches 12 and 13 in preferences for outer island nonremote and remote locations -- despite the relatively small probabilities of civil service appointment (10% and 50%) -- is consistent with the relatively low disutilities estimated for these positions (except in the least preferred provinces). If there is bias in the results, it is difficult to know in which direction it goes. Consequently, a conservative approach to interpreting the compensating differentials is to accept relative magnitudes, but be cautious about absolute magnitudes.

A drawback of the compensating differentials estimates is that, by definition, they describe the value at which respondents with specified characteristics would divide themselves evenly between the two alternatives given. Since doctors may vary in their tastes, it would be of interest to determine how the proportion of doctors choosing, say, service in Irian Jaya as salary increases. This is a complex computational task; our results allow us easily to estimate the

proportion who would choose Irian Jaya over Jakarta *if there were only those two choices*. Of course, in practice the doctor must choose among a large number of alternatives; our task is to calculate the probability of choosing each alternative from the complete set, given the predicted preferences between each pair of alternatives. To do this properly requires a more detailed treatment of heterogeneity of tastes, and will be a topic for follow-on work.

Policy implications

1. Problems with the current situation.

There are two problems. First, compulsory service is inequitable for medical students, mostly females, who are unable to accept remote or distant postings. The burden imposed by these postings is evident in the huge disutilities attached to these postings-- compulsory service in a very remote area is viewed as equivalent to a 'tax' of Rp 4 million or more a month. These graduates are faced with an unattractive set of alternatives: indefinite unemployment, illegal work as a doctor, or abandonment of their training in favor of a nonmedical career. Alternatively, if public authorities waive the rules and allow these graduates to satisfy their compulsory service in Jakarta or West Java, other graduates may perceive this as inequitable.

Second, providing specialist training as an incentive is not only expensive, but inefficient. Doctors who are particularly interested in specialist training may not be much interested in, or suited for, public health work in remote areas. Furthermore, delaying entry into specialist training by three years (of compulsory service) means that doctors do not complete that training until their late thirties or early forties. This significantly reduces the private and social returns to that training.

2. Possible modifications of the current policy

a) The estimates suggest that incentive payments for very remote (*sangat terpencil)* service of the order of Rp 1 to 1.5 million/month would be attractive to the median outer island male graduate. Based on a three year contract, this is less expensive, from the government's point of view, than the cost of paying for specialist training for 90% of these doctors[7]. The current total

[7] We are assuming that government or social costs of specialist training at public universities are comparable to those at private universities, estimated at about Rp 60 million.

supply of outer island male graduates is about 380/year, and the annual number of *sangat terpencil* posts open is approximately 200.

b) However, if the supply of outer island graduates is insufficient to fill the vacancies, then it would be necessary to continue to offer specialist training in order to induce many Javans to work in very remote areas. Cash incentives for graduates from Java would be more expensive than this training incentive. The results suggest that it is not necessary to offer a civil service appointment in addition to the specialist training, however.

c) Remote (*terpencil,* as opposed to very remote) posts in the outer islands can be filled by male public school graduates from Java with a salary bonus of about Rp 1 million/month (above Jakarta private wages -- making a total of about Rp 2 million/month), and from outside Java for a much smaller bonus, of perhaps Rp 300,000 for most provinces. The latter is much smaller, and the former is comparable to, the cost of the current policy of providing specialist training to 50% of the doctors in these posts.

d) The above policy could be integrated with one offering indefinite contract renewals to PTT doctors now serving in remote and very remote areas. A companion survey will provide data on the potential cost and impact of this policy.

e) Perhaps most importantly, both the revealed preference and stated preference results emphasize the much greater willingness of people from the outer islands to serve in remote and very remote locations. This suggests very substantial gains to increasing the representation of outer island students in medical schools. This might be accomplished by scholarships and assistance in pre-university preparation.

f) It has frequently been suggested that public health graduates might be trained as health center managers, as an alternative to using physicians as managers. The results presented here would encourage the establishment of such training programs in the outer islands, or for students from the outer islands. These students, lacking the urban employment prospects of doctors, would be expected to be even more willing to volunteer for remote and very remote service than outer island medical students.

g) Concurrently with the above policy changes, compulsory service for doctors might be abandoned, at least for students at private schools and for students at public schools willing to pay unsubsidized tuition fees.

REFERENCES

Adamowicz, W., J.Louviere and M. Williams. 1994 "Combining Revealed and Stated Preference Methods for Valuing Environmental Amenities." *Journal of Environmental Economics and Management, 26*(3), 271-292.

Alberini, Anna, Barbara Kanninen and Richard T. Carson. 1997. "Dichotomous Choice Contingent Valuation Data". *Land Economics 73*(3): 309-324.

Anderson, M. and M.W. Rosenberg. 1990. "Ontario's underserviced area program revisited: an indirect analysis". *Social Science and Medicine 30*(1):35-44.

Bolduc, D., B. Fortin and M.A. Fournier, forthcoming. "The Impact of Incentive Policies to Influence Practice Location of General Practitioners: a Multinomial Probit Analysis", *Journal of Labor Economics.*

Bunch, David S., Mark Bradley, Thomas F. Golob, Ryuichi Kitamura and Gareth P. Occhiuzzo. 1993. "Demand for Clean-Fuel Vehicles in California: A Discrete-Choice Stated Preference Pilot Project". *Transportation Research-A, 27A*(3):237-253.

Chesher, Andrew and Joao Santos Silva. 1995. Taste Variation in Discrete Choice Models. University of Bristol, Department of Economics. Discussion Paper No. 95/397.

Connor, R.A., S.D. Hillson, and J.E. Kralewski. 1995. "An Analysis of Physician Recruitment Strategies in Rural Hospitals". *Health Care Management Review 20*(1):7-18.

Cummings, Ronald G., Glenn W. Harrison, and E. Elisabet Rutström. 1995. "Homegrown Values and Hypothetical Surveys: Is the Dichotomous Choice Approach Incentive-Compatible"? *American Economic Review, 85*(1): 260-266.

Hurley, J. 1990. "Simulated effects of incomes-based policies on the distribution of physicians". *Medical Care, 28*(3): 221-38.

Kristiansen, I.S. 1992. "Medical Specialists' choice of location: the role of geographical attachment in Norway" *Social Science and Medicine 34*(1): 57-62.

Louviere, Jordan J. 1994. "Relating Stated Preference Measures and Models to Choices in Real Markets: Calibration of CV Responses". Paper prepared for the DOE/EPA Workshop on using Contingent Valuation to Measure Nonmarket Values, Herndon VA May 19-20, 1994.

Sawtooth Software, n.d. *CBC System.* Sequim, Washington.

Soemantri, S., Cholis Bachroen and Kemal N. Siregar, 1996. *Studi Awal Pendayagunaan Dokter PTT.* Research and Development Unit, Ministry of Health, Jakarta.

Taylor, Donald H. and Thomas C. Ricketts III. 1992, "Increasing Obstetrical Care Access to the Rural Poor". *Journal of Health Care for the Poor and Underserved, 4*(1), 9-20.

World Bank. 1993. *World Development Report 1993: Investing in Health.* New York: Oxford University Press.

World Bank. 1994. *Indonesia's Health Work Force: Issues and Options.* Report no. 12835-IND.

a) **APPENDIX TABLE 1: VARIABLE DEFINITIONS AND STATISTICS, REVEALED PREFERENCE ANALYSIS**

A. DEFINITIONS

age: age in 1996
marital: dummy, married
children: number of children
oi_sch: dummy, medical school outside Java/Bali
priv_sch: dummy, private medical school
spdoctor: dummy, spouse is a doctor
graduyr3: year of graduation

B. BATCH 12, MALES

Variable	Obs	Mean	Std. Dev.	Min	Max
age	283	29.49823	3.008704	26	49
MARITAL	283	.3038869	.4607492	0	1
CHILDREN	283	.2155477	.6009791	0	5
oi_sch	283	.2720848	.4458217	0	1
priv_sch	283	.2897527	.4544511	0	1
SPDOCTOR	283	.04947	.2172313	0	1
graduyr3	283	94.72438	.6316189	90	95

C. BATCH 12, FEMALES

Variable	Obs	Mean	Std. Dev.	Min	Max
age	290	29.21034	3.096023	25	44
MARITAL	290	.5068966	.5008167	0	1
CHILDREN	290	.3068966	.6326913	0	3
oi_sch	290	.2	.4006914	0	1
priv_sch	290	.3827586	.4869003	0	1
SPDOCTOR	290	.0931034	.2910796	0	1
graduyr3	290	94.57931	.8738331	89	95

D. BATCH 13, MALES

Variable	Obs	Mean	Std. Dev.	Min	Max
age	383	28.83812	2.865193	24	43
MARITAL	383	.2872063	.4530505	0	1
CHILDREN	383	.227154	.6536999	0	5
oi_sch	383	.464752	.4994084	0	1
priv_sch	383	.2114883	.4088979	0	1
SPDOCTOR	383	.0809399	.2730996	0	1
graduyr3	383	95.12272	.9588829	89	96

E. BATCH 13, FEMALES

Variable	Obs	Mean	Std. Dev.	Min	Max
age	295	28.19322	2.728027	24	44
MARITAL	295	.4338983	.4964535	0	1
CHILDREN	295	.2677966	.6542485	0	4
oi_sch	295	.4983051	.5008467	0	1
priv_sch	295	.2542373	.4361715	0	1
SPDOCTOR	295	.1491525	.3568441	0	1
graduyr3	295	95	1.020204	88	96

APPENDIX TABLE 2A

BATCH 12 MALES

Multinomial regression — Number of obs = 283; chi2(21) = 152.67; Prob > chi2 = 0.0000; Log Likelihood = -233.8589; Pseudo R2 = 0.2461

provrmt1	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Outer Island nonremote						
age	-.1241292	.1044222	-1.189	0.235	-.328793	.0805346
MARITAL	.557725	.5721089	0.975	0.330	-.5635879	1.679038
CHILDREN	-.462538	.5393669	-0.858	0.391	-1.519678	.5946017
oi_sch	3.850212	.6010213	6.406	0.000	2.672232	5.028192
priv_sch	1.336518	.5540064	2.412	0.016	.2506859	2.422351
SPDOCTOR	-.3850349	1.183606	-0.325	0.745	-2.704859	1.934789
graduyr3	-.3030369	.3156624	-0.960	0.337	-.9217239	.31565
_cons	29.15078	30.731	0.949	0.343	-31.08088	89.38245
Outer Island remote						
age	-.1405831	.1114062	-1.262	0.207	-.3589352	.077769
MARITAL	-.2557866	.6241109	-0.410	0.682	-1.479021	.9674483
CHILDREN	-.9073868	.7688577	-1.180	0.238	-2.41432	.5995466
oi_sch	3.77406	.5391176	7.000	0.000	2.717409	4.830711
priv_sch	.2704817	.5528874	0.489	0.625	-.8131577	1.354121
SPDOCTOR	.6502684	1.041951	0.624	0.533	-1.391919	2.692455
graduyr3	.3249293	.4803456	0.676	0.499	-.6165308	1.266389
_cons	-29.00467	45.86409	-0.632	0.527	-118.8966	60.88729
Outer Island very remote						
age	.0332398	.109213	0.304	0.761	-.1808136	.2472933
MARITAL	-.6785836	.6438654	-1.054	0.292	-1.940537	.5833695
CHILDREN	-.0048397	.4625567	-0.010	0.992	-.9114342	.9017548
oi_sch	3.542948	.5598649	6.328	0.000	2.445633	4.640263
priv_sch	-1.674387	.8723153	-1.919	0.055	-3.384094	.0353197
SPDOCTOR	-44.20309	.	.	.	.	.
graduyr3	-.3902734	.3429819	-1.138	0.255	-1.062506	.2819588
_cons	33.87223	33.1551	1.022	0.307	-31.11058	98.85503

(Outcome provrmt1==Jawa & B is the comparison group)

APPENDIX TABLE 2B
BATCH 12, FEMALES

Multinomial regression — Number of obs = 290
chi2(21) = 115.46
Prob > chi2 = 0.0000
Log Likelihood = -182.25407 — Pseudo R2 = 0.2406

provrmt1	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Outer Island nonremote						
age	.013778	.0811935	0.170	0.865	-.1453583	.1729143
MARITAL	-.3688953	.4796584	-0.769	0.442	-1.309009	.5712179
CHILDREN	.2448923	.3496392	0.700	0.484	-.440388	.9301725
oi_sch	3.437769	.4760645	7.221	0.000	2.504699	4.370838
priv_sch	.5789649	.4831991	1.198	0.231	-.3680879	1.526018
SPDOCTOR	1.492807	.60046	2.486	0.013	.3159273	2.669687
graduyr3	-.2098006	.2029136	-1.034	0.301	-.607504	.1879028
_cons	16.83452	19.87388	0.847	0.397	-22.11757	55.7866
Outer Island remote						
age	.1330548	.0994033	1.339	0.181	-.0617721	.3278817
MARITAL	-1.093825	.641113	-1.706	0.088	-2.350383	.1627334
CHILDREN	.1503781	.4951581	0.304	0.761	-.820114	1.12087
oi_sch	3.802586	.5881998	6.465	0.000	2.649736	4.955436
priv_sch	-.6060551	.7069732	-0.857	0.391	-1.991697	.779587
SPDOCTOR	1.559218	.948813	1.643	0.100	-.300421	3.418857
graduyr3	-.0578562	.3555778	-0.163	0.871	-.754776	.6390635
_cons	-1.149503	34.18644	-0.034	0.973	-68.1537	65.8547
Outer Island very remote						
age	-.093665	.3433381	-0.273	0.785	-.7665954	.5792655
MARITAL	-21.81218	1.198711	-18.196	0.000	-24.16161	-19.46274
CHILDREN	-39.80506	1.25e+09	0.000	1.000	-2.45e+09	2.45e+09
oi_sch	1.401955	1.250433	1.121	0.262	-1.048849	3.852759
priv_sch	-.6333743	1.426186	-0.444	0.657	-3.428648	2.161899
SPDOCTOR	22.55989	.	.	.	.	.
graduyr3	.3836602	1.07136	0.358	0.720	-1.716167	2.483487
_cons	-36.92709	103.6514	-0.356	0.722	-240.0801	166.2259

(Outcome provrmt1==Jawa & B is the comparison group)

APPENDIX TABLE 2C
BATCH 13, MALES

Multinomial regression

Number of obs	= 383
chi2(21)	= 143.56
Prob > chi2	= 0.0000
Pseudo R2	= 0.1376

Log Likelihood = -449.86333

provrmt1	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Outer Island nonremote						
age	-.1111011	.0883762	-1.257	0.209	-.2843153	.0621132
MARITAL	-.9645574	.5889225	-1.638	0.101	-2.118824	.1897094
CHILDREN	.2506882	.4874255	0.514	0.607	-.7046482	1.206025
oi_sch	3.685305	.7065425	5.216	0.000	2.300507	5.070103
priv_sch	1.433465	.5008063	2.862	0.004	.4519027	2.415027
SPDOCTOR	.7825769	.7323342	1.069	0.285	-.6527717	2.217925
graduyr3	.7742842	.2330639	3.322	0.001	.3174874	1.231081
_cons	-70.91739	22.88618	-3.099	0.002	-115.7735	-26.06129
Outer Island remote						
age	-.2055039	.0901082	-2.281	0.023	-.3821126	-.0288951
MARITAL	-1.401922	.6110201	-2.294	0.022	-2.599499	-.2043445
CHILDREN	.4401251	.4939446	0.891	0.373	-.5279886	1.408239
oi_sch	3.722087	.6970834	5.340	0.000	2.355828	5.088345
priv_sch	.8937679	.5079367	1.760	0.078	-.1017698	1.889306
SPDOCTOR	.9549834	.7578044	1.260	0.208	-.5302859	2.440253
graduyr3	.5810809	.218274	2.662	0.008	.1532717	1.00889
_cons	-49.44252	21.49635	-2.300	0.021	-91.5746	-7.310448
Outer Island very remote						
age	.0014752	.0854615	0.017	0.986	-.1660261	.1689766
MARITAL	-.3871185	.5524567	-0.701	0.483	-1.469914	.6956767
CHILDREN	.1742179	.4723127	0.369	0.712	-.7514981	1.099934
oi_sch	3.526986	.6991653	5.045	0.000	2.156647	4.897325
priv_sch	.4040116	.5191938	0.778	0.436	-.6135895	1.421613
SPDOCTOR	-1.970863	1.182279	-1.667	0.096	-4.288088	.3463611
graduyr3	1.024132	.2423728	4.225	0.000	.5490897	1.499174
_cons	-97.61006	23.76774	-4.107	0.000	-144.194	-51.02614

(Outcome provrmt1==Jawa & B is the comparison group)

APPENDIX TABLE 2D
BATCH 13, FEMALES

Multinomial regression — Number of obs = 295
chi2(21) = 145.09
Prob > chi2 = 0.0000
Log Likelihood = -294.10069 — Pseudo R2 = 0.1979

provrmt1	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Outer island nonremote						
age	-.1189277	.0936575	-1.270	0.204	-.3024931	.0646376
MARITAL	.0359726	.5088964	0.071	0.944	-.9614459	1.033391
CHILDREN	.0711081	.3554449	0.200	0.841	-.6255511	.7677673
oi_sch	3.82478	.6972768	5.485	0.000	2.458143	5.191418
priv_sch	.6348682	.5045185	1.258	0.208	-.3539698	1.623706
SPDOCTOR	.833417	.5787424	1.440	0.150	-.3008973	1.967731
graduyr3	.5998963	.2214786	2.709	0.007	.1658063	1.033986
_cons	-54.20297	21.7051	-2.497	0.013	-96.74419	-11.66175
Outer Island remote						
age	-.1335339	.1093644	-1.221	0.222	-.3478842	.0808164
MARITAL	-.7044551	.6165873	-1.143	0.253	-1.912944	.5040337
CHILDREN	.1420596	.4351483	0.326	0.744	-.7108153	.9949345
oi_sch	4.928999	.7504803	6.568	0.000	3.458085	6.399913
priv_sch	.7270435	.6213775	1.170	0.242	-.490834	1.944921
SPDOCTOR	2.103193	.7086708	2.968	0.003	.7142236	3.492162
graduyr3	.9449086	.3007622	3.142	0.002	.3554256	1.534392
_cons	-87.82871	29.26284	-3.001	0.003	-145.1828	-30.4746
Outer Island very remote						
age	-.0321541	.1300435	-0.247	0.805	-.2870347	.2227266
MARITAL	-.8309908	.8888162	-0.935	0.350	-2.573038	.9110568
CHILDREN	-37.65063	1.21e+08	0.000	1.000	-2.38e+08	2.38e+08
oi_sch	3.505597	.8378328	4.184	0.000	1.863475	5.147719
priv_sch	.2755101	.8430683	0.327	0.744	-1.376874	1.927894
SPDOCTOR	1.03143	1.153166	0.894	0.371	-1.228735	3.291594
graduyr3	.7891714	.4251077	1.856	0.063	-.0440243	1.622367
_cons	-75.77971	41.28481	-1.836	0.066	-156.6964	5.137018

(Outcome provrmt1==Jawa & B is the comparison group)

APPENDIX TABLE 3: STATED PREFERENCE VARIABLE DESCRIPTION

VARIABLE DEFINITIONS

Examples: dlama= delta contract length =
contract length in alternative 1 - contract length in alterntative 2

djat = JATENG1-JATENG2
where JATENGi=1 if alternative i is in Central Java, =0 otherwise

35.	dlama	delta contract length
36.	dgaji	delta salary, 000Rp/mo
37.	dpns	delta civil service probability
38.	dspe	delta specialist probability
39.	dbias	delta nonremote
40.	dterp	delta remote
42.	djat	delta Central Java
43.	dkalt	delta Central Kalimantan
44.	dsuls	delta South Sulawesi
45.	dntt	delta East Nusa Tenggara
46.	dsumut	delta North Sumatra
47.	dirja	delta Irian Jaya
74.	s_dlama	private school*delta contract length
75.	s_dgaji	private school *delta salary, 000Rp/mo
76.	s_dpns	private school*delta civil service probability
77.	s_dspe	private school *delta specialist probability
91.	dhomeprv	delta (post=birth province)
92.	dsekprop	delta (post=school province)
105.	dumurspe	delta age avail for training*specialist probability
101.	ddesst	delta rural background*very remote
101.	ddesst	delta rural background*very remote
106.	dluluspe	delta ever failed a course*specialist probability

MALE JAVA-BALI: SUMMARY STATISTICS

Variable	Obs	Mean	Std. Dev.	Min	Max
dlama	3690	.0520325	1.40228	-2	2
dgaji	3690	65.78591	1311.786	-2500	2500
dpns	3690	2.905149	44.91146	-80	80
dspe	3690	-.7750678	45.77866	-80	80
dbias	3690	.0168022	.7025798	-1	1
dterp	3690	.0192412	.7046363	-1	1
djat	3690	-.0075881	.5415227	-1	1
dkalt	3690	.0062331	.5260512	-1	1
dsuls	3690	-.0054201	.5455385	-1	1
dntt	3690	.0170732	.525811	-1	1
dsumut	3690	.0170732	.5380417	-1	1
dirja	3690	-.0303523	.5239197	-1	1
s_dlama	3690	.0162602	.6778501	-2	2
s_dgaji	3690	24.52575	636.872	-2500	2500
s_dpns	3690	1.143631	21.65536	-80	80
s_dspe	3690	-.6287263	22.22718	-80	80
dhomeprv	3690	-.003252	.3192398	-1	1
dsekprop	3690	.001626	.362213	-1	1
dumurspe	3690	-25.26287	1305.238	-3110	2980
ddesst	3690	-.0081301	.3832195	-1	1
ddesst	3690	-.0081301	.3832195	-1	1
dluluspe	3690	-1.154472	35.79512	-80	80

FEMALE JAVA-BALI: SUMMARY STATISTICS

Variable	Obs	Mean	Std. Dev.	Min	Max
dlama	3276	-.0128205	1.408314	-2	2
dgaji	3276	77.45726	1296.741	-2500	2500
dpns	3276	1.782662	44.34146	-80	80
dspe	3276	-1.117216	45.37448	-80	80
dbias	3276	.0363248	.7004202	-1	1
dterp	3276	.0155678	.7102749	-1	1
djat	3276	-.0094628	.5421773	-1	1
dkalt	3276	.0164835	.5251274	-1	1
dsuls	3276	-.0027473	.5411256	-1	1
dntt	3276	.0030525	.5265383	-1	1
dsumut	3276	.0128205	.5412627	-1	1
dirja	3276	-.0357143	.5232959	-1	1
s_dlama	3276	.01221	.903515	-2	2
s_dgaji	3276	11.5232	839.4387	-2500	2500
s_dpns	3276	.3113553	28.47408	-80	80
s_dspe	3276	-.3540904	29.47474	-80	80
dhomeprv	3276	.0015263	.3710897	-1	1
dsekprop	3276	.0088523	.4145238	-1	1
dumurspe	3276	-32.83272	1284.412	-2970	2870
ddesst	3276	-.009768	.2794146	-1	1
ddesst	3276	-.009768	.2794146	-1	1
dluluspe	3276	.4517705	32.66546	-80	80

MALE OUTER ISLAND: SUMMARY STATISTICS

Variable	Obs	Mean	Std. Dev.	Min	Max
dlama	2016	.0287698	1.408646	-2	2
dgaji	2016	73.53671	1303.728	-2500	2500
dpns	2016	1.964286	44.45323	-80	80
dspe	2016	-.6746032	46.0913	-80	80
dbias	2016	-.0049603	.7037476	-1	1
dterp	2016	.0262897	.7029208	-1	1
djat	2016	-.0292659	.5416972	-1	1
dkalt	2016	.0218254	.5229425	-1	1
dsuls	2016	.0039683	.5401811	-1	1
dntt	2016	.0034722	.5229121	-1	1
dsumut	2016	.0257937	.5459795	-1	1
dirja	2016	-.015377	.5274233	-1	1
s_dlama	2016	-.0059524	.6532714	-2	2
s_dgaji	2016	23.80952	612.8209	-2500	2500
s_dpns	2016	1.10119	20.63454	-80	80
s_dspe	2016	-.0396825	21.27449	-80	80
dhomeprv	2016	.0104167	.4448666	-1	1
dsekprop	2016	.0138889	.4999311	-1	1
dumurspe	2016	-20.59524	1339.665	-2810	2810
ddesst	2016	-.000496	.3707678	-1	1
ddesst	2016	-.000496	.3707678	-1	1
dluluspe	2016	-.7142857	42.65024	-80	80

FEMALE OUTER ISLAND: SUMMARY STATISTICS

Variable	Obs	Mean	Std. Dev.	Min	Max
dlama	1548	-.0180879	1.403084	-2	2
dgaji	1548	123.2235	1269.179	-2500	2500
dpns	1548	2.131783	44.61836	-80	80
dspe	1548	-.5167959	45.58027	-80	80
dbias	1548	.0691214	.698879	-1	1
dterp	1548	.005168	.7027321	-1	1
djat	1548	.0090439	.5392622	-1	1
dkalt	1548	-.0116279	.5283132	-1	1
dsuls	1548	-.005814	.5387071	-1	1
dntt	1548	.0180879	.5305737	-1	1
dsumut	1548	.0122739	.5361929	-1	1
dirja	1548	-.0335917	.5285961	-1	1
s_dlama	1548	-.0103359	.7217351	-2	2
s_dgaji	1548	45.21964	641.2277	-2500	2500
s_dpns	1548	.6847545	23.26423	-80	80
s_dspe	1548	.0904393	23.05087	-80	80
dhomeprv	1548	.0174419	.4181786	-1	1
dsekprop	1548	.0103359	.5096576	-1	1
dumurspe	1548	-13.02326	1301.994	-2820	2730
ddesst	1548	-.0200258	.3012355	-1	1
ddesst	1548	-.0200258	.3012355	-1	1
dluluspe	1548	-.6976744	39.01209	-80	80

APPENDIX TABLE 4: STATED PREFERENCE ESTIMATES

4A. MALES, JAVA-BALI

Probit Regression with Huber standard errors — Number of obs = 3690
Log Likelihood =-1785.0489 — Pseudo R2 = .

Grouping variable: id

pil1	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
dlama	-.0704826	.0351163	-2.007	0.045	-.1393093	-.0016559
dgaji	.0003754	.0000291	12.912	0.000	.0003184	.0004323
dpns	.0082162	.0009159	8.971	0.000	.0064211	.0100113
dspe	.0347098	.0116248	2.986	0.003	.0119257	.0574939
dbias	.0136313	.0382208	0.357	0.721	-.0612801	.0885428
dterp	-.0341724	.061449	-0.556	0.578	-.1546103	.0862655
dst	-.3659125	.0687266	-5.324	0.000	-.5006141	-.2312109
djat	-.0925484	.0683281	-1.354	0.176	-.2264691	.0413723
dkalt	-.4192969	.0915411	-4.580	0.000	-.5987142	-.2398796
dsuls	-.3114099	.0736019	-4.231	0.000	-.455667	-.1671528
dntt	-.3510476	.0833915	-4.210	0.000	-.5144919	-.1876033
dsumut	-.1815521	.0696759	-2.606	0.009	-.3181144	-.0449897
dirja	-.7443214	.096986	-7.675	0.000	-.9344104	-.5542324
s_dlama	-.1429247	.0497177	-2.875	0.004	-.2403696	-.0454797
s_dgaji	-.0002086	.0000536	-3.894	0.000	-.0003135	-.0001036
s_dpns	-.005407	.0015072	-3.588	0.000	-.008361	-.002453
dsekprop	.1659393	.0837393	1.982	0.048	.0018132	.3300654
dumurspe	-.0007512	.0004064	-1.848	0.065	-.0015477	.0000454

4B. FEMALES, JAVA-BALI

Probit Regression with Huber standard errors — Number of obs = 3276
Log Likelihood =-1464.7073 — Pseudo R2 = .

Grouping variable: id

pil1	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
dlama	-.1081921	.0383393	-2.822	0.005	-.1833358	-.0330484
dgaji	.0002524	.0000224	11.272	0.000	.0002085	.0002963
dpns	.0067926	.0006654	10.208	0.000	.0054884	.0080967
dspe	.0286451	.014069	2.036	0.042	.0010704	.0562199
dbias	.0051289	.0412365	0.124	0.901	-.0756933	.085951
dterp	-.3289197	.0728737	-4.514	0.000	-.4717496	-.1860897
dst	-.7738035	.0889796	-8.696	0.000	-.9482004	-.5994066
djat	.220269	.0764291	2.882	0.004	.0704706	.3700673
dkalt	-.2914487	.1100936	-2.647	0.008	-.5072282	-.0756693
dsuls	-.2748354	.0904313	-3.039	0.002	-.4520775	-.0975933
dntt	-.2678134	.1135186	-2.359	0.018	-.4903057	-.0453211
dsumut	-.1834204	.0798705	-2.296	0.022	-.3399637	-.026877
dirja	-.7720885	.1123198	-6.874	0.000	-.9922311	-.5519458
s_dlama	-.1044407	.0448962	-2.326	0.020	-.1924358	-.0164457
dhomeprv	.1820854	.1067371	1.706	0.088	-.0271155	.3912862
dsekprop	.2107087	.1057574	1.992	0.046	.003428	.4179894
dumurspe	-.0006431	.000503	-1.278	0.201	-.001629	.0003428

4C. MALES FROM OUTER ISLANDS

Probit Regression with Huber standard errors — Number of obs = 2016
Log Likelihood =-981.98104 — Pseudo R2 = .

Grouping variable: id

pil1	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
dlama	.0070333	.0445805	0.158	0.875	-.080343	.0944095
dgaji	.000391	.0000365	10.714	0.000	.0003195	.0004626
dpns	.0101825	.0012098	8.417	0.000	.0078114	.0125537
dspe	.0488409	.0168881	2.892	0.004	.0157409	.081941
dbias	.106396	.0536511	1.983	0.047	.0012419	.2115502
dterp	-.024822	.0987274	-0.251	0.801	-.218324	.1686801
dst	-.2406674	.109521	-2.197	0.028	-.4553246	-.0260103
djat	.0000529	.0791665	0.001	0.999	-.1551107	.1552164
dkalt	.0490552	.1065622	0.460	0.645	-.159803	.2579133
dsuls	-.102688	.0924082	-1.111	0.266	-.2838048	.0784288
dntt	-.0925702	.1110943	-0.833	0.405	-.3103109	.1251706
dsumut	.0151435	.0750817	0.202	0.840	-.1320139	.162301
dirja	-.1956504	.1147449	-1.705	0.088	-.4205463	.0292455
s_dlama	-.1802936	.0848115	-2.126	0.034	-.3465211	-.0140661
s_dpns	-.0046865	.0019581	-2.393	0.017	-.0085242	-.0008487
s_dspe	.0053577	.0033587	1.595	0.111	-.0012252	.0119406
dsekprop	.3731865	.0861189	4.333	0.000	.2043966	.5419764
dumurspe	-.001259	.0005891	-2.137	0.033	-.0024136	-.0001044

4D. FEMALES FROM OUTER ISLANDS

Probit Regression with Huber standard errors — Number of obs = 1548
Log Likelihood = -745.2308 — Pseudo R2 = .

Grouping variable: id

pil1	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
dlama	-.0924159	.0422767	-2.186	0.029	-.1752767	-.0095551
dgaji	.0002725	.0000332	8.197	0.000	.0002073	.0003376
dpns	.0115387	.001592	7.248	0.000	.0084184	.014659
dspe	.0308539	.0148516	2.077	0.038	.0017454	.0599625
dbias	.147008	.0616457	2.385	0.017	.0261847	.2678313
dterp	-.1059933	.1039206	-1.020	0.308	-.309674	.0976874
dst	-.4019779	.1192324	-3.371	0.001	-.6356692	-.1682867
djat	-.0563346	.0896582	-0.628	0.530	-.2320614	.1193923
dkalt	-.2076515	.1508219	-1.377	0.169	-.503257	.087954
dsuls	-.343934	.109064	-3.154	0.002	-.5576956	-.1301724
dntt	-.4410467	.1576276	-2.798	0.005	-.7499912	-.1321022
dsumut	-.2040547	.1067864	-1.911	0.056	-.4133521	.0052428
dirja	-.6736021	.1497839	-4.497	0.000	-.9671732	-.380031
s_dpns	-.0068558	.0025871	-2.650	0.008	-.0119264	-.0017851
dhomeprv	.294753	.1304114	2.260	0.024	.0391514	.5503547
dsekprop	.4961757	.1066754	4.651	0.000	.2870958	.7052555
ddesterp	.3175753	.1393712	2.279	0.023	.0444128	.5907378
dumurspe	-.0007887	.0005136	-1.536	0.125	-.0017954	.000218

APPENDIX B1: MEDICAL STUDENT SURVEY:
QUESTIONNAIRE COVER SHEET

Ikatan Dokter Indonesia (PB IDI)
Jl. Dr. Sam Ratulangi No. 29
Jakarta 10350
Telp. (021) 3150679, 3900473

PT CORINTHIAN Infopharma Corpora
(A member of The CIC Consulting Group)
Jl. Raden Saleh, No. 46 - 48 Jakarta Pusat 10330
Telp. (021) 324335, 3150345, 3155357, 3155358

SURVEY PREFERENSI PENEMPATAN

Pengurus Besar Ikatan Dokter Indonesia (PB IDI) bekerja sama dengan ***PT CORINTHIAN Infopharma Corpora, a member of the CIC Consulting Group***, suatu perusahaan konsultan independen di bidang riset pemasaran, saat ini sedang melakukan penelitian mengenai preferensi penempatan dokter, dengan mahasiswa Fakultas Kedokteran tingkat klinik sebagai target responden. Penelitian ini bertujuan untuk mengetahui motivasi dokter untuk ditempatkan di suatu daerah tertentu dengan berbagai bentuk kompensasi dan kondisi pekerjaan, sehingga hasil penelitian diharapkan dapat bermanfaat bagi pengembangan usul-usul kebijakan dalam memajukan sistem penempatan dan pendayagunaan tenaga dokter di Indonesia. Oleh karena itu, kami sangat mengharapkan kesediaan saudara sebagai sampel terpilih untuk meluangkan waktu menjawab pertanyaan yang akan kami ajukan. Nama saudara sebagai responden tidak perlu dicantukan sehingga kerahasiaan identitas terjamin dan dikemudian hari tidak mempengaruhi tugas/karir saudara. Atas kesediaan dan partisipasinya, kami ucapkan terima kasih.

A. BAGIAN PERTAMA

Wilayah penelitian:

☐ Medan	☐ Bandung	☐ Yogyakarta	☐ Bali
☐ Jakarta	☐ Semarang	☐ Surabaya	☐ Ujung Pandang

Universitas :

☐ Universitas Sumatera Utara (USU)	☐ Universitas Tarumanegara (UNTAR)
☐ Universitas Indonesia (UI)	☐ Universitas Trisakti
☐ Universitas Padjajaran (UNPAD)	☐ Universitas Yarsi
☐ Universitas Diponegoro (UNDIP)	☐ Universitas Kristen Indonesia (UKI)
☐ Universitas Gajah Mada (UGM)	☐ Universitas Kristen Krida Wacana UKRIDA
☐ Universitas Airlangga (UNAIR)	☐ Universitas Katholik Indonesia Atmajaya
☐ Universitas UDAYANA	☐ Universitas lainnya
☐ Universitas Hasanuddin (UNHAS)	(sebutkan.....)

APPENDIX B2:

Background questionnaire, survey of medical students

Note: a rough English translation has been added in italics

C.1. Tempat kelahiran responden : Kota.....Propinsi .....
Birthplace: *city* *province*

C.2. Tahun kelahiran responden : 19☐☐
birth year

C.3. Catat Jenis kelamin (tanpa ditanyakan) : *Gender*

Laki-laki *male*	[01]	Perempuan *female*	[02]

C.4. Agama : *Religion*

Islam	[03]	Budha	[06]
Kristen Protestan	[04]	Hindu	[07]
Katholik	[05]	Lainnya	[08]

C.5. Status perkawinan : *marital status*

Kawin *married*	[01]	*If unmarried, continue at C.9*
Belum kawin *unmarried*	[02] ☞	**Bila belum menikah, dilanjutkan ke C.9**

C.6. Bila sudah menikah, apakah istri/suami* anda bekerja? (* *coret yang tidak perlu*)
if married, does your spouse work?

Ya *yes*	[01]	Tidak *no*	[02]

C.7. Jumlah anak : *number of children* *If no children, continue at C.9*

- Belum punya anak *none* [00] ☞ **Bila belum punya anak, dilanjutkan ke C.9**
- Sudah punya anak: *one or more:*

Satu orang	[01]	Tiga orang	[03]
Dua orang	[02]	Empat orang	[04]
		Lebih dari empat *more than 4*	[05]

C.8. Umur anak tertua : *age of oldest child*

Kurang dari 3 tahun *<3 yrs*	[01]	7 - 8 tahun	[04]
3 - 4 tahun	[02]	9 - 10 tahun	[05]
5 - 6 tahun	[03]	Lebih dari 10 tahun *>10*	[06]

C.9. Tahun masuk Universitas ? Tahun 19☐☐
Year entered university

C.10. Sekarang ini, saudara sudah semester berapa ? Semester ☐☐
Current semester in school

C.11. Menurut perkiraan saudara, kapan lulus dari universitas ini ? Tahun 19 ☐☐

expected year of graduation

C.12. Apakah saudara pernah tidak lulus dalam mata kuliah ?
Have you ever failed a course?

a. Pre Klinik	Pernah *Yes* [01]	; berapa kali ? *..number of times....* kali
	Tidak pernah [02]	
b. Klinik	Pernah [01]	; berapa kali ? *.number of times.....* kali
	Tidak pernah [02]	

C.13. Pekerjaan orang tua : *Parent's occupation*

Petani/Nelayan *farming/fishing*	[01]	Karyawan swasta setingkat supervisor *supervisory-level employee*	[09]
Pedagang *petty trade*	[02]	Karyawan swasta setingkat manajer *manager*	[10]
Wiraswasta (TK* < 5 orang) *TK = Tenaga Kerja (# employees)* *small entrepreneur*	[03]	ABRI setingkat Bintara *armed forces*	[11]
		ABRI setingkat Perwira *armed forces*	[12]
Wiraswasta (TK 5 - 50 orang) *medium entrepreneur*	[04]	Tenaga terampil (bengkel/elektronik/dsb) *skilled worker*	[13]
Wiraswasta (TK > 50 orang) *large entrepreneur*	[05]	Profesional (pengacara, artis, dsb)	[14]
Pegawai negeri golongan I-II *Civil servant, lower rank*	[06]	Pensiunan/Purnawirawan *retiree*	[15]
Pegawai negeri golongan III-IV *Civil servant, higher rank*	[07]		
		Lainnya (sebutkan .....) *other, specify*	[16]
Karyawan swasta biasa *'ordinary' worker*	[08]		

C.14. Di mana saudara paling lama bertempat tinggal/dibesarkan (sebelum mahasiswa) ?
Where were you brought up (longest residence, before becoming a student)

Desa *village*	[00]	Ibukota propinsi kecuali Jakarta *provincial capital except Jakarta*	[03]
Ibukota kecamatan *subdistrict town*	[01]	Jakarta	[04]
Ibukota Kabupaten/Kotamadya *district capital*	[02]	Luar Negeri *abroad*	[05]
		Lainnya, sebutkan..... *other, specify*	[06]

APPENDIX B3:
Instructions to respondents, medical student questionnaire

SURVEY PREFERENSI PENEMPATAN DOKTER
PETUNJUK PENGISIAN

A. Bagian Pertama (halaman depan)

- Merupakan identitas responden secara umum yang terdiri dari wilayah penelitian (nama kota) dan universitas.
- Lingkari jawaban yang sesuai
- Bila nama universitas tidak tercantum dalam daftar, lingkari nomor 15 (Universitas lainnya) dan tulis nama universitas tersebut.

B. Bagian Kedua, merupakan pertanyaan utama tentang preferensi dokter/calon dokter.

- Setiap responden mendapat salah satu versi dari total 50 versi yang ada.
- Bagian ini terdiri dari 18 pertanyaan yang merupakan pilihan kombinasi. Untuk setiap pertanyaan saudara diharapkan memilih salah satu dari dua pilihan jawaban (lingkari nomor 1 atau 2).
- Setiap pertanyaan merupakan dua kemungkinan penempatan tugas dengan berbagai karakteristik, yang akan dihadapi setelah saudara menyelesaikan pendidikan kedokteran.
- Bacalah dengan teliti sebelum menentukan pilihan/jawaban anda karena setiap kombinasi pilihan adalah berbeda.
- Saudara harus menentukan pilihan untuk setiap pertanyaan walaupun kombinasinya dirasakan tidak realistik (Jawaban harus satu pilihan dan tidak boleh kosong).
- Dalam pengisian pertanyaan **dilarang** untuk saling bertanya/berdiskusi diantara sesama teman dan bila ada hal yang kurang jelas harap ditanyakan langsung kepada petugas.
- Setiap pertanyaan terdiri dari 7 butir kata yang masing-masing mempunyai pengertian sebagai berikut:

1. *Propinsi*, adalah :
   Lokasi yang menunjukkan tempat penempatan tugas tersebut diatas.
2. *Keterpencilan*, adalah :
   Keadaan keterpencilan dari lokasi penempatan tugas (biasa, terpencil atau sangat terpencil).
3. *Tempat kerja*, adalah :
   Jenis penempatan tugas (tempat kerja) berupa puskesmas atau klinik swasta dalam rangka menyelesaikan wajib kerja. Dalam hal ini, saudara bekerja secara purnawaktu dan tinggal di daerah tempat kerja tersebut kecuali dalam masa cuti.
4. *Lama ikatan kerja*, adalah :
   Lamanya suatu ikatan kerja atau masa kontrak dokter di daerah tersebut (dalam satuan tahun).
5. *Pendapatan per bulan* adalah :
   Total penghasilan rata-rata per bulan dari semua sumber, yaitu :
   a. Gaji : yang dibayar secara penuh dan tepat waktu selama saudara memenuhi kewajiban / tugas saudara.
   b. Praktek swasta.
6. *Kemungkinan diangkat pegawai negri*, adalah :
   Kesempatan atau peluang untuk diangkat menjadi Pegawai Negri Sipil (PNS) setelah menyelesaikan masa ikatan kerja, yang dinyatakan dalam bentuk persentase.

7. *Kesempatan spesialisasi*, adalah :
   Kemungkinan mendapat peluang/kesempatan pendidikan spesialis dengan beasiswa setelah menyelesaikan masa ikatan kerja, yang dinyatakan dalam bentuk persentase.

C. Bagian Ketiga (latar belakang)

- Bagian ini merupakan data tentang demografi (latar belakang responden) -- cukup jelas
- Untuk setiap pertanyaan, isilah jawaban atau lingkari nomor yang sesuai.

ANNEX B4: Allowed combinations of remoteness and province in medical student survey

	Private clinic	nonremote health center	remote health center	very remote health center
Jakarta				
Central Java				
Central Kalimantan				
South Sulawesi				
East Nusa Tenggara				
North Sumatra				
Irian Jaya				

The shaded combinations were prohibited; all unshaded combinations were allowed.

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS1869	Risk Reducation and Public Spending	Shantayanan Devarajan Jeffrey S. Hammer	January 1998	C. Bernardo 31148
WPS1870	The Evolution of Poverty and Inequality in Indian Villages	Raji Jayaraman Peter Lanjouw	January 1998	P. Lanjouw 34529
WPS1871	Just How Big Is Global Production Sharing?	Alexander J. Yeats	January 1998	L. Tabada 36896
WPS1872	How Integration into the Central African Economic and Monetary Community Affects Cameroon's Economy: General Equilibrium Estimates	Ferdinand Bakoup David Tarr	January 1998	L. Tabada 36896
WPS1873	Wage Misalignment in CFA Countries: Are Labor Market Policies to Blame?	Martin Rama	January 1998	S. Fallon 38009
WPS1874	Health Policy in Poor Countries: Weak Links in the Chain	Deon Filmer Jeffrey Hammer Lant Pritchett	January 1998	S. Fallon 38009
WPS1875	How Deposit Insurance Affects Financial Depth (A Cross-Country Analysis)	Robert Cull	January 1998	P. Sintim-Aboagye 37644
WPS1876	Industrial Pollution in Economic Development (Kuznets Revisited)	Hemamala Hettige Muthukumara Mani David Wheeler	January 1998	D. Wheeler 33401
WPS1877	What Improves Environmental Performance? Evidence from Mexican Industry	Susmita Dasgupta Hemamala Hettige David Wheeler	January 1998	D. Wheeler 33401
WPS1878	Searching for Sustainable Microfinance: A Review of Five Indonesian Initiatives	R. Marisol Ravicz	February 1998	M. Ravicz 85582
WPS1879	Relative prices and Inflation in Poland, 1989–97: The Special Role of Administered Price Increases	Przemyslaw Wozniak	February 1998	L. Barbone 32556
WPS1880	Foreign Aid and Rent-Seeking	Jakob Svensson	February 1998	R. Martin 39065
WPS1881	The Asian Miracle and Modern Growth Theory	Richard R. Nelson Howard Pack	February 1998	C. Bernardo 31148
WPS1882	Interretional Resource Transfer and Economic Growth in Indonesia	Toshihiko Kawagoe	February 1998	R. Martin 39065

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS1883	Intersectoral Resource Allocation and Its Impact on Economic Development in the Philippines	Fumihide Takeuchi Takehiko Hagino	February 1998	K. Labrie 31001
WPS1884	Fiscal Aspects of Evolving Federations: Issues for Policy and Research	David E. Wildasin	February 1998	C. Bernardo 31148
WPS1885	Aid, Taxation, and Development: Analytical Perspectives on Aid Effectiveness in Sub-Saharan Africa	Christopher S. Adam Stephen A. O'Connell	February 1998	K. Labrie 31001
WPS1886	Country Funds and Asymmetric Information	Jeffrey A. Frankel Sergio L. Schmukler	February 1998	R. Martin 39065
WPS1887	The Structure of Derivatives Exchanges: Lessons from Developed and Emerging Markets	George Tsetsekos Panos Varangis	February 1998	P. Kokila 33716